

1 CLAIMS

2 I claim:

3 1. A fungal inoculant composition comprising seeds and a fungal inocula  
4 selected from the group of fungi consisting of saprophytic fungi,  
5 entomopathogenic fungi and combinations thereof.

6 2. The fungal inoculant composition of claim 1 wherein the seeds are  
7 selected from the group consisting of seed of garden vegetables, agricultural  
8 crops, grasses, herbs, shrubs, and trees and the fungal inocula is selected  
9 from the group consisting of spores, conidia, actively growing mycelial  
10 hyphae, dried mycelial hyphae, freeze-dried mycelial hyphae, powdered  
11 mushrooms and mixtures thereof.

12 3. The fungal inoculant composition of claim 1 wherein the fungal inocula  
13 further comprises a fungi selected from the group consisting of mycorrhizal  
14 fungi, parasitic fungi, fungi imperfecti and combinations thereof.

15 4. The fungal inoculant composition of claim 3 wherein the fungi is selected  
16 from the group consisting of:

17 a) gilled mushrooms including *Agaricus*, *Agrocybe*, *Armillaria*, *Clitocybe*,  
18 *Collybia*, *Conocybe*, *Coprinus*, *Flammulina*, *Giganopanus*, *Gymnopilus*,  
19 *Hypholoma*, *Inocybe*, *Hypsizygus*, *Lentinula*, *Lentinus*, *Lenzites*,  
20 *Lepiota*, *Lepista*, *Lyophyllum*, *Macrocybe*, *Marasmius*, *Mycena*,  
21 *Omphalotus*, *Panaeolus*, *Panellus*, *Pholiota*, *Pleurotus*, *Pluteus*,

- 1       *Psathyrella, Psilocybe, Schizophyllum, Sparassis, Stropharia,*  
2       *Termitomyces, Tricholoma, Volvariella* and combinations thereof;  
3       b) polypore mushrooms including *Albatrellus, Antrodia, Bjerkandera,*  
4       *Bondarzewia, Bridgeoporus, Ceriporia, Coltricia, Daedalea,*  
5       *Dentocorticium, Echinodontium, Fistulina, Flavodon, Fomes,*  
6       *Fomitopsis, Ganoderma, Gloeophyllum, Grifola, Hericium,*  
7       *Heterobasidion, Inonotus, Irpex, Laetiporus, Meripilus, Oligoporus,*  
8       *Oxyporus, Phaeolus, Phellinus, Piptoporus, Polyporus, Schizopora,*  
9       *Trametes, Wolfiporia* and combinations thereof;  
10      c) Basidiomycetes including *Auricularia, Calvatia, Ceriporiopsis,*  
11      *Coniophora, Cyathus, Lycoperdon, Merulius, Phlebia, Serpula,*  
12      *Sparassis, Stereum* and combinations thereof;  
13      d) Ascomycetes including *Cordyceps, Morchella, Tuber, Peziza* and  
14      combinations thereof;  
15      e) jelly fungi including *Tremella*;  
16      f) the mycorrhizal mushrooms and endomycorrhizal and ectomycorrhizal  
17      non-mushroom fungi including *Acaulospora, Alpova, Amanita,*  
18      *Astraeus, Athelia, Boletinellus, Boletus, Cantharellus, Cenococcum,*  
19      *Dentinum, Gigaspora, Glomus, Gomphidius, Hebeloma, Lactarius,*  
20      *Paxillus, Piloderma, Pisolithus, Rhizophagus, Rhizopogon, Rozites,*

1       *Russula, Sclerocytis, Scleroderma, Scutellospora, Suillus, Tuber* and  
2       combinations thereof;

3       g) fungi with a perfect and an imperfect state including *Phanerochaete*  
4       and *Cordyceps* and combinations thereof;

5       h) the fungi imperfecti and related molds and yeasts including

6       *Actinomyces, Alternaria, Aspergillus, Botrytis, Candida, Chaetomium,*

7       *Chrysosporium, Cladosporium, Cryptococcus, Dactylium, Doratomyces*

8       (*Stysanus*), *Epicoccum, Fusarium, Geotrichum, Gliocladium,*

9       *Humicola, Monilia, Mucor, Mycelia Sterilia, Mycogone, Neurospora,*

10       *Papulospora, Penicillium, Rhizopus, Scopulariopsis, Sepedonium,*

11       *Streptomyces, Talaromyces, Torula, Trichoderma, Trichothecium,*

12       *Verticillium* and combinations thereof; and

13       i) entomopathogenic fungi including *Metarhizium, Beauveria,*

14       *Paecilomyces, Verticillium, Hirsutella, Aspergillus, Akanthomyces,*

15       *Desmidiospora, Hymenostilbe, Mariannaea, Nomuraea, Paraisaria,*

16       *Tolypocladium, Spicaria, Botrytis, Rhizopus*, the Entomophthoraceae

17       and other Phycomycetes, *Cordyceps* and combinations thereof.

18       5. The fungal inoculant composition of claim 1 wherein the composition  
19       further comprises seedlings.

20       6. The fungal inoculant composition of claim 1 wherein the fungal  
21       inoculant further comprises a liquid.

1     7. The fungal inoculant composition of claim 6 wherein the liquid is  
2     selected from the group consisting of water, vegetable oils, lubricants and  
3     mixtures thereof.

4     8. The fungal inoculant composition of claim 1 wherein the fungal  
5     inoculant is applied to a fiber substrate material.

6     9. The fungal inoculant composition of claim 8 wherein the fiber substrate  
7     material is selected from the group consisting of landscaping cloth, mulch,  
8     paper products and cardboard.

9     10. The fungal inoculant composition of claim 9 wherein the landscaping  
10    cloth material is selected from the group consisting of geocloths, geofabrics,  
11    soil blankets, landscaping fabrics, fabrics, nettings, rugs, mats, mattings,  
12    fiber felt pads, tatamis, mattress inserts, burlap bags, gabions, fiber logs,  
13    fiber bricks, fiber baskets, pressed cardboards, corrugated cardboards, papers  
14    and combinations thereof and the mulch material is selected from the group  
15    consisting of mulches of wood chips, sawdust, wood pulp, straw, cardboard,  
16    agricultural waste fibers, composts and combinations thereof.

17    11. The fungal inoculant composition of claim 9 wherein the mulch is  
18    dispersed by equipment selected from the group consisting of hydroseeding  
19    equipment, pressure spray equipment and agricultural equipment.

20    12. The fungal inoculant composition of claim 8 wherein the fiber substrate  
21    material comprises a fiber selected from the group consisting of wood, wood

1 chips, sawdust, wood pulp, wood wastes, wood pellets, paper fiber pellets, leaf  
2 paper, wood-based papers, non-wood papers, pressed cardboard, corrugated  
3 cardboard, fiberized rag stock, cellophane, hemp and hemp-like materials,  
4 bamboo, papyrus, jute, flax, sisal, coconut husk fibers, cereal straws, reeds,  
5 grasses, seed hulls, cornstalks, corncobs, soybean roughage, coffee plants,  
6 coffee waste, coffee pulp, sugar cane bagasse, banana fronds, palm leaves, nut  
7 hulls, soy waste, cactus waste, tea leaves, agricultural waste products, wool,  
8 hair, hide and combinations thereof.

9 13. The fungal inoculant composition of claim 8 wherein the fiber substrate  
10 additionally comprises an amendment selected from the group consisting of  
11 germination enhancers, growth enhancers, sugars, molasses, sorghum,  
12 mannitol, sorbitol, corn steep liquor, corn meal and soybean meal, vegetable  
13 oils, casein hydrolysate, grain brans, grape pumice, ammonium salts, amino  
14 acids, yeast extract, vitamins, nutritional supplements, surface active agents,  
15 wetting agents, spore encapsulating materials, hyphae encapsulating  
16 materials, yeasts, bacteria, fungi imperfecti and combinations thereof.

17

18 14. A fungal inoculant composition comprising:

19 a) a saprophytic mushroom inoculant selected from the group consisting  
20 of spores, actively growing mycelial hyphae, dried mycelial hyphae,

- 1 freeze-dried mycelial hyphae, powdered mushrooms and mixtures  
2 thereof;
- 3 b) a fiber substrate transfer agent selected from the group consisting of  
4 landscaping cloths, mulch and combinations thereof;
- 5 c) wherein the landscaping cloths are selected from the group consisting  
6 of geocloths, geofabrics, soil blankets, landscaping fabrics, fabrics,  
7 nettings, rugs, mats, mattings, fiber felt pads, tatamis, mattress  
8 inserts, burlap bags, fiber logs, fiber bricks, fiber baskets, gabions,  
9 fiber ropes, pressed cardboard, corrugated cardboards, papers and  
10 combinations thereof; and
- 11 d) wherein the mulch comprises a material selected from the group  
12 consisting of mulches prepared from wood chips, sawdust, wood pulp,  
13 straw, compost, agricultural waste products, cardboard, paper and  
14 combinations thereof.
- 15 15. The mycofiltration composition of claim 14 wherein the saprophytic  
16 mushroom inoculant comprises inoculant of a saprophyte selected from the  
17 group consisting of:
- 18 a) gilled mushrooms including *Agaricus*, *Agrocybe*, *Armillaria*, *Clitocybe*,  
19 *Collybia*, *Conocybe*, *Coprinus*, *Flammulina*, *Giganopanus*, *Gymnopilus*,  
20 *Hypholoma*, *Inocybe*, *Hypsizygus*, *Lentinula*, *Lentinus*, *Lenzites*,  
21 *Lepiota*, *Lepista*, *Lyophyllum*, *Macrocybe*, *Marasmius*, *Mycena*,

- 1       *Omphalotus, Panaeolus, Panellus, Pholiota, Pleurotus, Pluteus,*  
2       *Psathyrella, Psilocybe, Schizophyllum, Sparassis, Stropharia,*  
3       *Termitomyces, Tricholoma, Volvariella* and combinations thereof;  
4       b) polypore mushrooms including *Albatrellus, Antrodia, Bjerkandera,*  
5       *Bondarzewia, Bridgeoporus, Ceriporia, Coltricia, Daedalea,*  
6       *Dentocorticium, Echinodontium, Fistulina, Flavodon, Fomes,*  
7       *Fomitopsis, Ganoderma, Gloeophyllum, Grifola, Hericium,*  
8       *Heterobasidion, Inonotus, Irpex, Laetiporus, Meripilus, Oligoporus,*  
9       *Oxyporus, Phaeolus, Phellinus, Piptoporus, Polyporus, Schizopora,*  
10       *Trametes, Wolfiporia* and combinations thereof;  
11       c) Basidiomycetes including *Auricularia, Calvatia, Ceriporiopsis,*  
12       *Coniophora, Cyathus, Lycoperdon, Merulius, Phlebia, Serpula,*  
13       *Sparassis and Stereum;*  
14       d) Ascomycetes including *Cordyceps, Morchella, Tuber, Peziza* and  
15       combinations thereof; and  
16       e) jelly fungi including *Tremella.*  
17       16. The mycofiltration composition of claim 15 wherein the saprophytic  
18       mushroom inoculant additionally comprises inoculant of fungi selected from  
19       the group consisting of:  
20       a) the mycorrhizal mushrooms and endomycorrhizal and ectomycorrhizal  
21       non-mushroom fungi including *Acaulospora, Alpova, Amanita,*

- 1       *Astraeus, Athelia, Boletinellus, Boletus, Cantharellus, Cenococcum,*  
2       *Dentinum, Gigaspora, Glomus, Gomphidius, Hebeloma, Lactarius,*  
3       *Paxillus, Piloderma, Pisolithus, Rhizophagus, Rhizopogon, Rozites,*  
4       *Russula, Sclerocytis, Scleroderma, Scutellospora, Suillus, Tuber* and  
5       combinations thereof;
- 6       b) fungi with a perfect and an imperfect state including *Phanerochaete*  
7       and *Cordyceps* and combinations thereof;
- 8       c) the fungi imperfecti and related molds and yeasts including  
9       *Actinomyces, Alternaria, Aspergillus, Botrytis, Candida, Chaetomium,*  
10       *Chrysosporium, Cladosporium, Cryptococcus, Dactylium, Doratomyces*  
11       *(Stysanus), Epicoccum, Fusarium, Geotrichum, Gliocladium,*  
12       *Humicola, Monilia, Mucor, Mycelia Sterilia, Mycogone, Neurospora,*  
13       *Papulospora, Penicillium, Rhizopus, Scopulariopsis, Sepedonium,*  
14       *Streptomyces, Talaromyces, Torula, Trichoderma, Trichothecium,*  
15       *Verticillium* and combinations thereof; and
- 16       d) entomopathogenic fungi including *Metarhizium, Beauveria,*  
17       *Paecilomyces, Verticillium, Hirsutella, Aspergillus, Akanthomyces,*  
18       *Desmidiospora, Hymenostilbe, Mariannaea, Nomuraea, Paraisaria,*  
19       *Tolypocladium, Spicaria, Botrytis, Rhizopus,* the Entomophthoraceae  
20       and other Phycomycetes, *Cordyceps* and combinations thereof.



1     17. The mycofiltration composition of claim 14 wherein the saprophytic  
2 mushroom inoculant comprises a mushroom species selected from the group  
3 consisting of *Pleurotus* species, *Trametes* species, *Ganoderma* species, *Fomes*  
4 *fomentarius*, *Fomitopsis officinalis*, *Fomitopsis pinicola*, *Stropharia*  
5 *rugosoannulata*, *Phellinus igniarius*, *Phellinus linteus*, *Psilocybe azurescens*  
6 and *Psilocybe cyanescens*, *Collybia* species and *Coprinus comatus* and the  
7 fiber substrate transfer agent is applied to a substrate contaminated with a  
8 contaminant selected from the group consisting of polynuclear aromatic  
9 hydrocarbons, cyclic hydrocarbons and carbonaceous compounds, chemical  
10 pesticides including organophosphates, halogenated compounds, nitrogenous  
11 compounds, hormones and pro-hormones, detergents and soaps, textile dyes,  
12 bacteria, viruses, protozoa, nematodes, medical wastes, agricultural runoff,  
13 urban runoff, silt, sediment, industrial wastes, mine wastes and combinations  
14 thereof.

15     18. The mycofiltration composition of claim 14 wherein the landscaping  
16 cloths have a form selected from the group consisting of textile, veil, matted,  
17 mesh matting, matting rug, felt pressing, blanket, filter, woven, woven  
18 roving, open weave, nonwoven, knitted, strand roving, continuous strand,  
19 chopped strand, milled fiber, knotted, yarn, braided, high-pressure extrusion,  
20 composites and combinations thereof.

21

- 1     19. A fungal inoculation delivery system for mycofiltration and  
2     mycoremediation comprising:
- 3         a) a fungal inoculant selected from the group consisting of mushroom  
4             spores, actively growing mycelial hyphae, dried mycelial hyphae,  
5             freeze-dried mycelial hyphae, powdered mushrooms, conidia and  
6             mixtures thereof; and
- 7         b) a fiber substrate to which the fungal inoculant is applied selected from  
8             the group consisting of geocloths, geofabrics, soil blankets, landscaping  
9             fabrics and other fabrics, nettings, rugs, mats, mattings, fiber felt pads,  
10            straw tatamis, mattress inserts, burlap bags, papers, fiber logs, fiber  
11            bricks, fiber baskets, gabions, mulch and combinations thereof.
- 12     20. The fungal inoculation delivery system of claim 19 wherein the fiber  
13     substrate comprises materials selected from the group consisting of pressed  
14     cardboard, corrugated cardboard cardboards, leaf paper, wood-based paper,  
15     non-wood paper, wood chips, sawdust, wood pulp, wood mulch, wood wastes,  
16     wood pellets, paper fiber pellets, rag stock, cellophane, hemp, hemp-like  
17     materials, bamboo, papyrus, jute, flax, sisal, coconut fibers and coir, wheat  
18     straw, rice straw, rye straw, oat straw and other cereal straws, reeds,  
19     grasses, grain hulls, seed hulls, cornstalks, corncobs, soybean roughage,  
20     coffee plants, waste and pulp, sugar cane bagasse, banana fronds, palm  
21     leaves, the hulls of nuts including almonds, walnuts, sunflower, pecans and

1   peanuts, soy waste, cactus waste, tea leaves, agricultural waste products,  
2   wool, hair, hide and combinations thereof.

3       21. The fungal inoculation delivery system of claim 19 wherein the fungal  
4   inoculant is applied to the fiber substrate and inoculated fiber substrate is  
5   applied to a separate layer of fiber substrate.

6       22. The fungal inoculation delivery system of claim 19 wherein the  
7   saprophytic fungi is selected from the group consisting of metal-concentrating  
8   mushroom fungi, phosphorus-rich fungi, anti-bacterial fungi and white rot  
9   fungi capable of degrading environmentally persistent organic compounds  
10   and those fungi effective against biological organisms selected from the group  
11   consisting of bacteria, viruses, yeasts, molds, protozoa, rotifers, nematodes  
12   and combinations thereof.

13       23. The fungal inoculation delivery system of claim 19 wherein the  
14   saprophytic fungi is a mushroom fungi selected from the group consisting of  
15   *Pleurotus* species; *Trametes* species; *Ganoderma* species; *Fomes fomentarius*;  
16   *Fomitopsis officinalis* and *F. pinicola*; *Phellinus igniarius* and *P. linteus*;  
17   *Psilocybe azurescens* and *P. cyanescens*; *Stropharia rugosoannulata*; *Collybia*,  
18   *Marasmius* and satellite genera; *Coprinus comatus*; *Lycoperdon perlatum* and  
19   *L. lilacinum*; *Psathyrella hydrophila* and combinations thereof.

1     24. The fungal inoculation delivery system of claim 19 wherein the  
2     mycofiltration comprises filtering of materials selected from the group  
3     consisting of biological organisms, sediment and silt.

4     25. The fungal inoculation delivery system of claim 19 wherein a fungal  
5     mycelium is allowed to grow on the fiber substrate and the fungal mycelium  
6     is metabolically suspended via a process selected from the group consisting of  
7     refrigeration, drying and freeze-drying.

8     26. The fungal inoculation delivery system of claim 19 wherein the delivery  
9     system additionally comprises a component selected from the group  
10    consisting of seeds and seedlings and combinations thereof.

11

12    27. A delivery system for mycotechnologies comprising:

- 13       a) a component manufactured from a biodegradable material;  
14       b) a fungal inoculant selected from the group consisting of spores,  
15       mycelium, powdered mushrooms and combinations thereof; and  
16       c) seeds.

17    28. The delivery system for mycotechnologies of claim 27 wherein the  
18    component manufactured from biodegradable materials and the fungal  
19    inoculant and seeds are separately packaged.

20    29. The delivery system for mycotechnologies of claim 27 wherein the  
21    biodegradable material is selected from the group consisting of wood,

1 cardboard, paper, straw and biodegradable polymer based materials and  
2 combinations thereof.

3 30. The delivery system for mycotechnologies of claim 27 wherein the  
4 biodegradable material forms at least part of a container selected from the  
5 group consisting of boxes, crates, sacks, socks and gabions.

6 31. The delivery system for mycotechnologies of claim 27 wherein the  
7 component is a cardboard box.

8 32. The delivery system for mycotechnologies of claim 27 wherein the  
9 spores and mycelium are selected from the group consisting of saprophytic  
10 fungi, mycorrhizal fungi, entomopathogenic fungi and combinations thereof  
11 and the powdered mushrooms are selected from the group consisting of  
12 gourmet and medicinal mushrooms and combinations thereof.

13 33. The delivery system for mycotechnologies of claim 27 wherein the seeds  
14 are seeds of plants selected from the consisting of vegetables, cereal crops,  
15 fruits, herbs, spices, shrubs, bushes and other agriculturally useful crops.

16 34. The delivery system for mycotechnologies of claim 27 further  
17 comprising a material selected from the group consisting of liquids, glues,  
18 adhesives, tackifiers and combinations thereof.

19 35. The delivery system for mycotechnologies of claim 27 wherein the  
20 biodegradable material contains the fungal inoculant and the seeds.

1     36. The delivery system for mycotechnologies of claim 27 wherein the  
2     component manufactured from biodegradable materials is a container at least  
3     partially filled with a fiber substrate.

4     37. The delivery system for mycotechnologies of claim 36 wherein the fiber  
5     substrate contains the fungal inoculant and the seeds.

6     38. The delivery system for mycotechnologies of claim 27 wherein a liquid  
7     contains the fungal inoculant.

8     39. The delivery system for mycotechnologies of claim 38 wherein liquid  
9     fungal inoculant is applied to the component.

10    40. The delivery system for mycotechnologies of claim 38 wherein the  
11    liquid also includes the seeds.

12    41. The delivery system for mycotechnologies of claim 38 wherein the  
13    liquid is removed after application to the component.

14    42. The delivery system for mycotechnologies of claim 27 wherein the  
15    component is at least a portion of a cardboard box.

16    43. The delivery system for mycotechnologies of claim 42 wherein the  
17    cardboard box becomes a medium for growth when the box is disassembled  
18    and water is added.

19    44. The delivery system for mycotechnologies of claim 42 wherein the  
20    cardboard box is a component of an educational kit.

1     45. The delivery system for mycotechnologies of claim 44 wherein the kit  
2 further comprises an ecological map paired with culturally and ecologically  
3 appropriate fungus and plant species.

4     46. The delivery system for mycotechnologies of claim 27 wherein the  
5 component is a cardboard component of a rescue kit for refugees, indigenous  
6 displaced persons and victims of natural and man-made disasters.

7     47. The delivery system for mycotechnologies of claim 46 wherein the  
8 component is a cardboard box.

9     48. The delivery system for mycotechnologies of claim 27 wherein the seeds  
10 are seeds of annual plants for use in creating seed stock for future plantings.

11

12     49. A mulch composition comprising a mulch selected from the group  
13 consisting of mulched wood chips, sawdust, wood pulp, corrugated cardboard,  
14 pressed cardboard, straw, agricultural waste fibers, composts and  
15 combinations thereof, a fungal inoculant selected from the group consisting of  
16 a saprophytic mushroom inoculant, an entomopathogenic fungal inoculant  
17 and combinations thereof, and seeds.

18     50. The mulch composition of claim 49 wherein the composition  
19 additionally comprises water.

1     51. The mulch composition of claim 49 wherein the fungal inoculant  
2 further comprises a fungi selected from the group consisting of mycorrhizal  
3 fungi, parasitic fungi, fungi imperfecti and combinations thereof.

4     52. The mulch composition of claim 49 wherein the fungal inoculant  
5 comprises a plurality of species.

6     53. The mulch composition of claim 49 wherein the delivery system  
7 additionally comprises a component selected from the group consisting of  
8 fertilizers, soil improvement substances, tackifiers and combinations thereof.

9     54. The mulch composition of claim 49 wherein the fungal inoculant is  
10 allowed to germinate prior to application.

11    55. The mulch composition of claim 49 wherein the fungal inoculant is  
12 allowed to germinate and form mycelium and the mycelium is metabolically  
13 suspended via a method selected from the group consisting of refrigeration,  
14 drying and freeze-drying.

15    56. The mulch composition of claim 49 wherein the fungal inoculant  
16 comprises a separate package of fungal inoculant.

17    57. The mulch composition of claim 49 wherein the seeds comprise a  
18 separate package of seeds.

19

20    58. Agricultural equipment including planting equipment, harvesting  
21 equipment, equipment for preparing agricultural fields and equipment for



1 other agricultural purposes wherein the agricultural equipment further  
2 comprises a means for delivering fungal inocula.

3 59. The agricultural equipment of claim 58 wherein the fungal inocula is  
4 selected from the group of fungi consisting of saprophytic fungi,  
5 entomopathogenic fungi, mycorrhizal fungi, fungi imperfecti and  
6 combinations thereof.

7 60. The agricultural equipment of claim 58 wherein the saprophytic fungi  
8 is selected from the group consisting of *Hypsizygus Ulmarius*, *Stropharia*  
9 *rugosoannulata*, *Coprinus comatus*, *Hypholoma sublateritium* and  
10 combinations thereof.

11 61. The agricultural equipment of claim 58 wherein the fungal inocula  
12 comprises a separate package of fungal inoculant suitable for use therewith.

13 62. The harvesting equipment of claim 58 wherein the fungal inocula is  
14 utilized to inoculate materials selected from the group consisting of straw,  
15 corn husks, corn cobs, cotton seeds and cotton wastes and the harvesting  
16 equipment is selected from the group consisting of round straw balers, square  
17 straw balers, corn huskers, corn shellers, cotton pickers, cotton strippers and  
18 cotton gins.

19 63. The agricultural equipment of claim 58 wherein:

20 a) the planting equipment is selected from the group consisting of  
21 seeders, air seeders, planters, air planters, plate planters, vacuum

- 1        planters, drills, air drills, air seeding systems, row crop cultivators,  
2        planting systems, inter-row planting systems, between row planting  
3        systems, rice transplanters and combinations thereof;
- 4        b) the harvesting equipment is selected from the group consisting of  
5        combines, round balers, square balers, hay cubers, threshers,  
6        threshing machines, forage harvesters, windrowers, rakes, tedders,  
7        mowers, rotary mowers, sicklebar mowers, slashers, cutters, straw  
8        choppers, stalk choppers, corn pickers, cotton strippers, cotton gins,  
9        corn huskers, shellers, rice harvesters, mechanical fruit pickers,  
10       mechanical nut pickers, loaders and combinations thereof;
- 11       c) the equipment for preparing agricultural fields is selected from the  
12       group consisting of sprayers, irrigators, plows, cultivators, air carts,  
13       tillers, tillage equipment, disks, openers, rippers, harrows, rotary hoes,  
14       blades, flail shredders, flail cutters, rotary cutters, manure spreaders,  
15       flame weeders, pruning machines, skids, scrapers, loaders, fertilizer  
16       spin spreaders, pendulum spreaders and combination thereof; and
- 17       d) the equipment for other agricultural purposes is selected from the  
18       group consisting of shredders and chippers and combinations thereof.
- 19       64. The harvesting equipment of claim 63 wherein the fungal inocula is  
20       utilized to inoculate the remaining agricultural wastes.

1     65. The harvesting equipment of claim 63 wherein the fungal inocula is  
2     utilized to inoculate the soil.

3

4     66. A method for preserving and restoring habitats and catalyzing habitat  
5     recovery utilizing saprophytic fungi as a keystone species, the method  
6     comprising:

7         a) inoculating a substrate with a saprophytic mushroom species to form  
8             an inoculated substrate; and

9         b) utilizing the inoculated substrate for sheet inoculation of at least one  
10             layer of lignin- and cellulose-containing substrate applied in the  
11             selected habitat.

12     67. The method for preserving and restoring habitats of claim 66 wherein  
13     the lignin- and cellulose-containing substrate in the selected habitat is  
14     exposed to water runoff.

15     68. The method for preserving and restoring habitats of claim 66  
16     additionally comprising a fungus selected from the group consisting of  
17     mycorrhizal fungi, entomopathogenic fungi, parasitic fungi, fungi imperfecti  
18     and combinations thereof.

19     69. The method for preserving and restoring habitats of claim 68 wherein  
20     the method additionally comprises adding plant sources selected from the  
21     group consisting of seeds and seedlings and combinations thereof.

1     70. The method for preserving and restoring habitats of claim 69 wherein  
2     the seeds and seedlings are selected from the group of plants consisting of  
3     garden vegetables, agricultural crops, grasses, herbs, shrubs, and trees.

4     71. The method for preserving and restoring habitats of claim 69 wherein  
5     the selected habitat is selected from the group consisting of gravel roads,  
6     farms, forests, riparian zones and buffers, urban landscapes and suburban  
7     landscapes.

8     72. The method for preserving and restoring habitats of claim 66 wherein  
9     the selected habitat contains a contaminant selected from the group  
10    consisting of sediments and silts, organic compounds, inorganic compounds,  
11    metals, biological organisms and combinations thereof.

12

13    73. A method for combating chemical and biological contaminants selected  
14    from the group consisting of organic compounds, inorganic compounds,  
15    metals, biological organisms, silt, sediment and combinations thereof  
16    comprising:

17       a) selecting a saprophytic mushroom species capable of remediating the  
18       contaminant and obtaining inocula of the saprophytic mushroom  
19       species;

20       b) inoculating a fiber structure constructed from the group of materials  
21       consisting of mulch, geocloths, geofabrics, soil blankets, landscaping

1 fabrics, fabrics, nettings, rugs, mats, mattings, fiber felt pads, straw  
2 tatamis, mattress inserts, burlap bags, papers, fiber logs, fiber bricks,  
3 gabions, fiber baskets, cardboards, papers and combinations thereof  
4 with the saprophytic mushroom fungi to form a fungally impregnated  
5 fiber structure; and  
6 c) contacting the fungally impregnated fiber substrate layer with a  
7 contaminated substrate.

8 74. The method for combating contaminants of claim 73 wherein the  
9 contaminated substrate is an aqueous substrate.

10 75. The method for combating contaminants of claim 74 wherein the  
11 fungally impregnated fiber structure filters a contaminant selected from the  
12 group consisting of biological organisms, sediments and silts.

13 76. The method for combating contaminants of claim 73 wherein the  
14 fungally inoculated fiber substrate is inoculated with fungi selected from the  
15 group consisting of phosphorus rich mushrooms and the contaminant is  
16 selected from the group consisting of phosphorus containing agricultural  
17 pesticides, fertilizers, animal wastes and combinations thereof.

18 77. The method for combating contaminants of claim 73 wherein the  
19 fungally inoculated fiber substrate is inoculated with fungi selected from the  
20 group consisting of *Pleurotus* species including *P. ostreatus* and *P.*  
21 *tuberregium*, *Trametes versicolor*, *Fomes fomentarius*, *Fomitopsis officinalis*,

1 *Fomitopsis pinicola*, *Phellinus igniarius*, *Phellinus linteus*, *Psilocybe*  
2 *azureus* and *Psilocybe cyanescens*, *Agrocybe arvalis*, *Collybia* spp.,  
3 *Coprinus comatus*, *Lycoperdon perlatum* and *L. lilacinum*, and *Psathyrella*  
4 *hydrophila*.

5 78. The method for combating contaminants of claim 73 wherein the  
6 contaminated substrate is a contaminated aqueous substrate selected from  
7 the group consisting of lakes, ponds, rivers, streams, creeks, runoffs,  
8 effluents, ditches and combinations thereof.

9

10 79. A composition for attracting insects to a centralized locus comprising an  
11 extract of at least one entomopathogenic fungal species infused into a  
12 biodegradable product selected from the group consisting of wood, wood chips,  
13 sawdust, wood pulp, wood mulch, wood wastes, wood pellets, pressed  
14 cardboard, corrugated cardboard cardboards, paper including leaf paper,  
15 wood-based paper, non-wood paper and paper pellets, rag stock, cellophane,  
16 hemp, hemp-like materials, cotton, bamboo, papyrus, jute, flax, sisal, coconut  
17 fibers and coir, wheat straw, rice straw, rye straw, oat straw and other cereal  
18 straws, reeds, hyacinth, kenaf, grasses, grains, grain hulls, seed hulls,  
19 cornstalks, corncobs, soybean roughage, coffee plants, waste and pulp, sugar  
20 cane bagasse, banana fronds, palm leaves, the hulls of nuts including  
21 almonds, walnuts, sunflower, pecans and peanuts, soy waste, cactus waste,

1 tea leaves, agricultural waste products, wool, hair, hide and combinations  
2 thereof.

3 80. The composition for attracting insects of claim 79 wherein the  
4 centralized locus is selected from the group consisting of insect monitoring  
5 stations, insect bait stations, insect traps and insect treatment and control  
6 methods.

7 81. The composition for attracting insects of claim 79 wherein the extract is  
8 capable of causing substantial mortality in a targeted insect.

9 82. The composition for attracting insects of claim 79 wherein  
10 biodegradable product is inoculated with an entomopathogenic fungi.

11

12 83. A method for attracting insects to a centralized locus comprising  
13 infusing an extract of at least one entomopathogenic fungal species into a  
14 biodegradable product selected from the group consisting of wood, wood chips,  
15 sawdust, wood pulp, wood mulch, wood wastes, wood pellets, pressed  
16 cardboard, corrugated cardboard cardboards, paper including leaf paper,  
17 wood-based paper, non-wood paper and paper pellets, rag stock, cellophane,  
18 hemp, hemp-like materials, cotton, bamboo, papyrus, jute, flax, sisal, coconut  
19 fibers and coir, wheat straw, rice straw, rye straw, oat straw and other cereal  
20 straws, reeds, hyacinth, kenaf, grasses, grains, grain hulls, seed hulls,  
21 cornstalks, corncobs, soybean roughage, coffee plants, waste and pulp, sugar

1 cane bagasse, banana fronds, palm leaves, the hulls of nuts including  
2 almonds, walnuts, sunflower, pecans and peanuts, soy waste, cactus waste,  
3 tea leaves, agricultural waste products, wool, hair, hide and combinations  
4 thereof.

5 84. The method for attracting insects of claim 83 wherein the centralized  
6 locus is selected from the group consisting of insect monitoring stations,  
7 insect bait stations, insect traps and insect control methods.

8 85. The method for attracting insects of claim 83 wherein the extract is  
9 capable of causing substantial mortality in a targeted insect.

10 86. The method for attracting insects of claim 83 wherein biodegradable  
11 product is inoculated with an entomopathogenic fungi.

12

13 87. A method for sequestering metals comprising:

- 14 a) selecting a metal-concentrating saprophytic mushroom species;  
15 b) inoculating a fiber substrate with the metal-concentrating saprophytic  
16 mushroom species; and  
17 c) contacting inoculated fiber substrates with substrates rich in metal.

18 88. The method for sequestering metals of claim 87 wherein the metal-  
19 concentrating saprophytic mushroom species is selected from the group  
20 consisting of *Collybia*, *Marasmius* and satellite genera.



1     89. The method for sequestering metals of claim 87 wherein the substrates  
2     rich in metal are selected from the group consisting of ores, mine effluents,  
3     industrial effluents and combinations thereof.

4     90. The method for sequestering metals of claim 89 wherein the metals are  
5     removed from the inoculated fiber substrates by means selected from  
6     mechanical procedures, chemical procedures, biological procedures and  
7     combinations thereof.

8     91. The method for sequestering metals of claim 89 wherein the ore is  
9     pretreated with microorganisms.

10

11     92. A method for sequestering carbon and accumulating carbon credits  
12     comprising introducing a fungal inoculant and sequestering carbon into a  
13     mycelial matrix exoskeleton, internal cell components and extracellular  
14     components.

15     93. The method for sequestering carbon of claim 92 further comprising  
16     introducing a plant component selected from the group consisting of seeds  
17     and seedlings.

18

19     94. A method for inoculating substrates for mycofiltration comprising a  
20     sandwich inoculation of two or more layers of fungal inoculum.